

FIG. 1A (PRIOR ART)

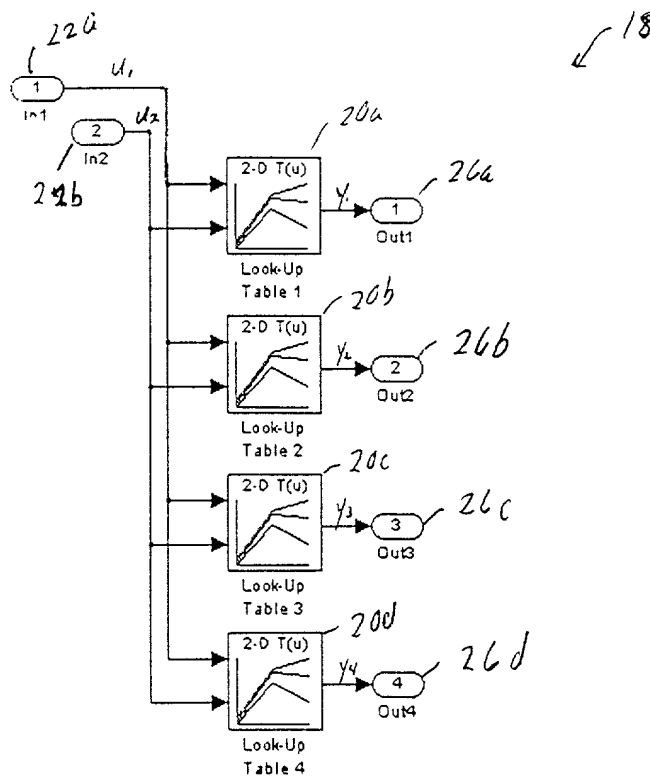


FIG. 1B (PRIOR ART)

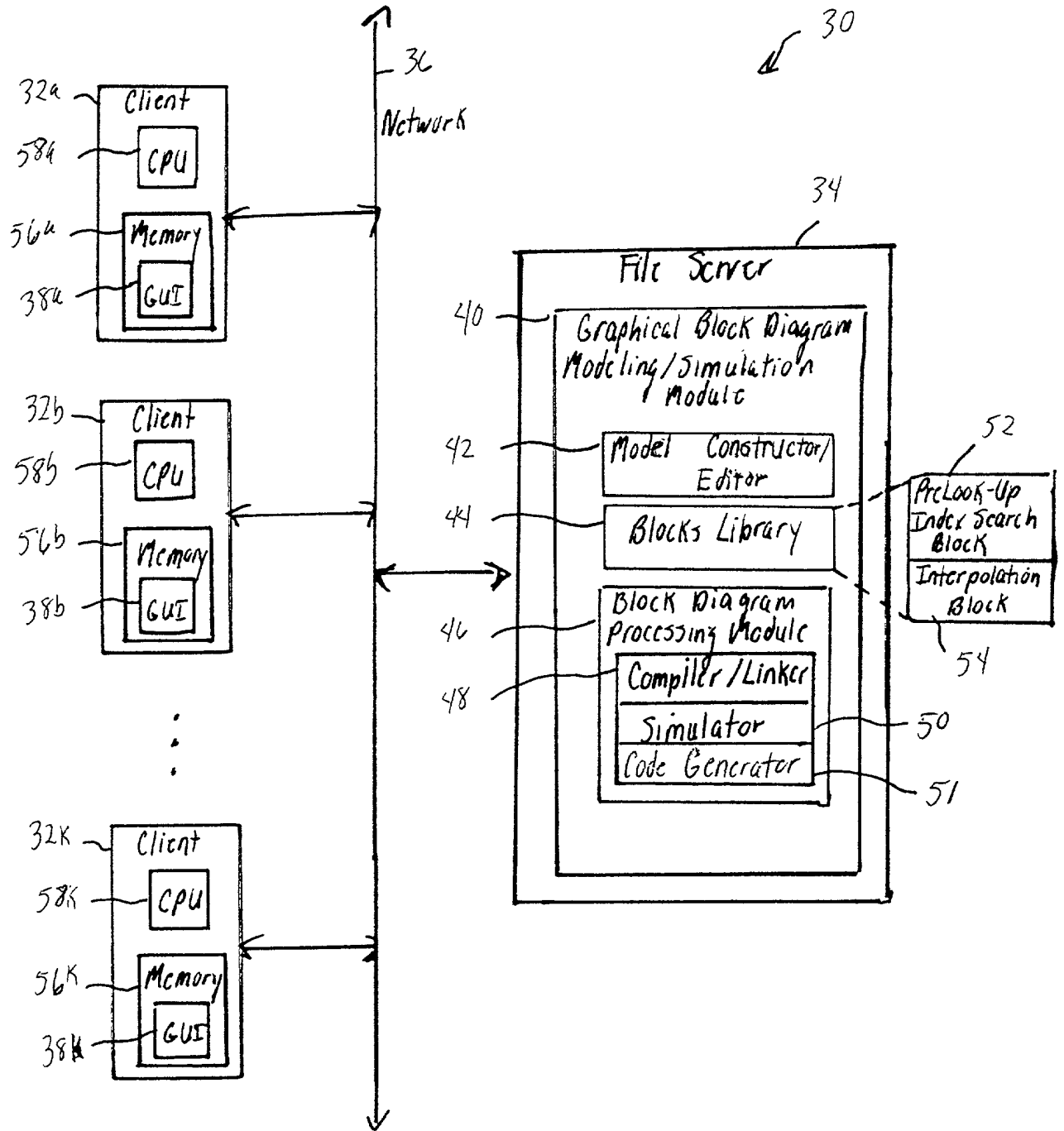


FIG. 2

40

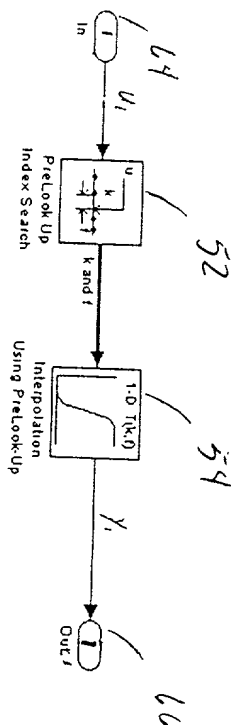


FIG. 3A

70

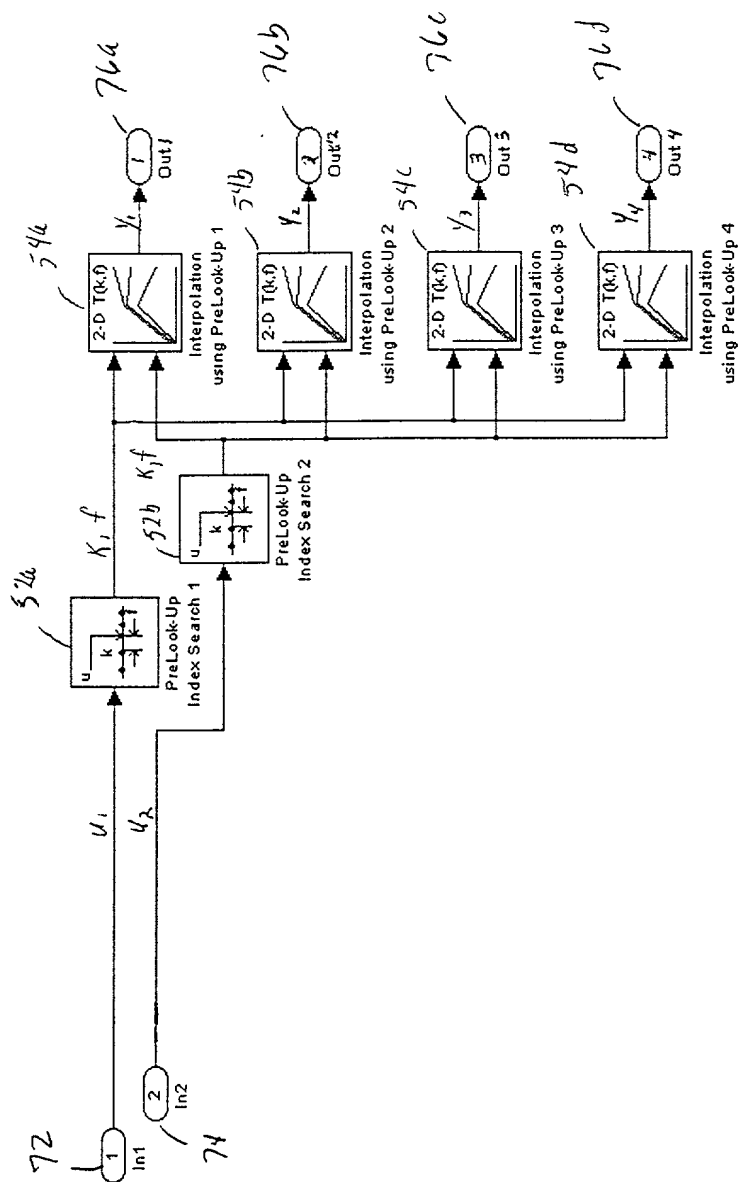


FIG. 30

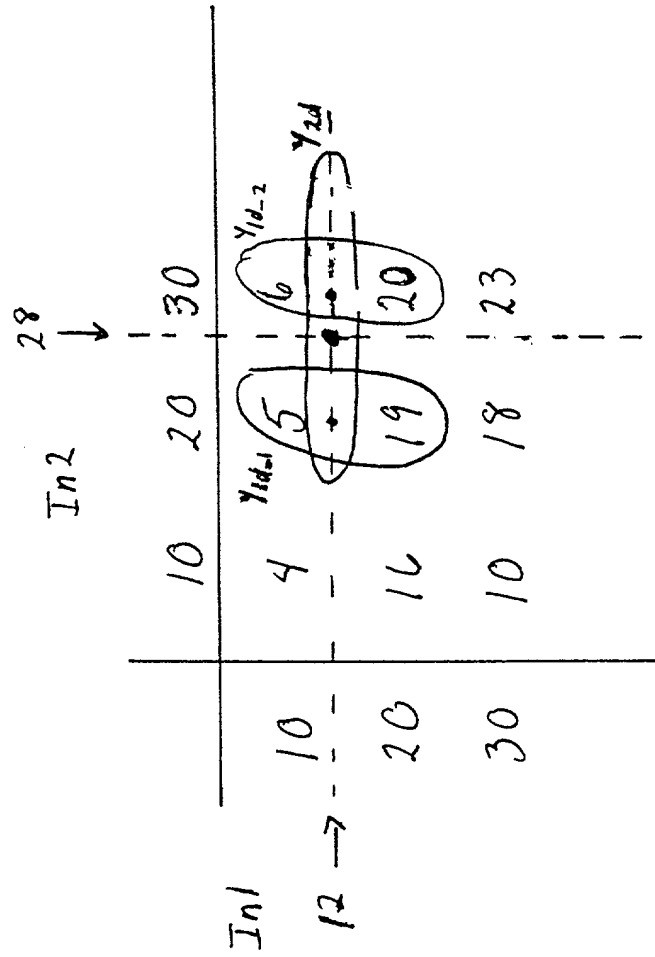


FIG. 4

The screenshot shows a Simulink model titled "lookup_example". The model's top bar includes menus for File, Edit, View, Simulation, Format, Tools, and Help. Below the menus is a toolbar with various icons. The main workspace contains the following components and connections:

- Inputs:** Two constant blocks are present: "Constant" with value 12 (labeled 72a) and "Constant1" with value 28 (labeled 72b).
- PreLook-Up Index Search:** Two blocks, labeled 52a and 52b, receive inputs from the constants and a common signal line (96d). They output 2-bit signals (96f and 96g) to the interpolation block.
- Look-Up Table (2-D):** Block 54 receives a 2-bit input (96h) and outputs a signal (96i) to the interpolation block.
- Interpolation (n-D) using PreLook-Up:** This block receives three 2-bit inputs (96f, 96g, 96h) and outputs a signal (96j) to the final display.
- Displays:**
 - A "Display" block shows the value 8.6, receiving input 96c.
 - A "Display" block shows values 0 and 0.2, receiving input 96b.
 - A "Display3" block shows the value 8.6, receiving input 96j.
 - A "Display1" block shows values 1 and 0.8, receiving input 96i.
- Handwritten Annotations:**
 - Blue lines and numbers (96a, 96b, 96c, 96d, 96e, 96f, 96g, 96h, 96i, 96j) trace the signal paths throughout the model.
 - Red numbers (72a, 72b, 52a, 52b, 54) identify specific blocks and their associated signals.
 - A red arrow labeled 92 points to the bottom left corner of the workspace.

The status bar at the bottom indicates the model is "Running" at "100%" scale, with a time of "T=2.000" and a "FixedStepDiscrete" solver.

FIG. 5

09909931.072004

Block Parameters: Look-Up Table (2-D)

Lookup Table (2-D) (mask) (link)

Performs 2-D linear interpolation of input values using the specified input/output table. Extrapolation is performed outside the table boundaries. The first dimension corresponds to the top (or left) input port.

Parameters

Row:
[10,20,30]

Column:
[10,20,30]

Table:
[4 5 6;16 19 20;10 18 23]

OK Cancel Help Apply

FIG. 6

Block Parameters: PreLook-Up Index Search

LookupIdxSearch [mask] [link]

Locate the input value's relative position within a range of numbers (the "breakpoint data" set). Returns an array of the interval index "k" and distance fraction "l" that the input "u" reaches into the kth interval.

Parameters

Breakpoint data: [10,20,30]

Index search method: Binary Search

☐ Begin index search using previous index result
 ☐ Output only the index

Process out of range input: Linear Extrapolation

Action for out of range input: None

OK

Cancel

Help

Apply

110a

112

- 114

FIG. 7A

215

Block Parameters: PreLook-Up Index Search1

LookUpIdxSearch (mask), (link)

Locate the input value's relative position within a range of numbers (the "breakpoint data" set). Returns an array of the interval index "k" and distance fraction "f" that the input "u" reaches into the kth interval.

Parameters

Breakpoint data:

Index search method:

☐ Begin index search using previous index result

☐ Output only the index

Process out of range input:

Action for out of range input:

1106

- 112

114

FIG. 7B

-115

Block Parameters: Interpolation (n-D) using PreLook-Up

LookupNDInterplx(mask) (link)

Perform n-dimensional (n-D) interpolated table lookup using precalculated indices and distance fractions. An n-D Table is a sampled representation of a function in N variables. This block is fed with the output of a PreLook-Up Index Search block. The first dimension corresponds to the top (or left) input port.

Parameters

Number of table dimensions: 2

Table data:

[4 5 6; 16 19 20; 10 18 23]

Interpolation method: Linear

Extrapolation method: Linear

Action for out of range input: None

OK Cancel Help Apply

116

118

FIG. 8

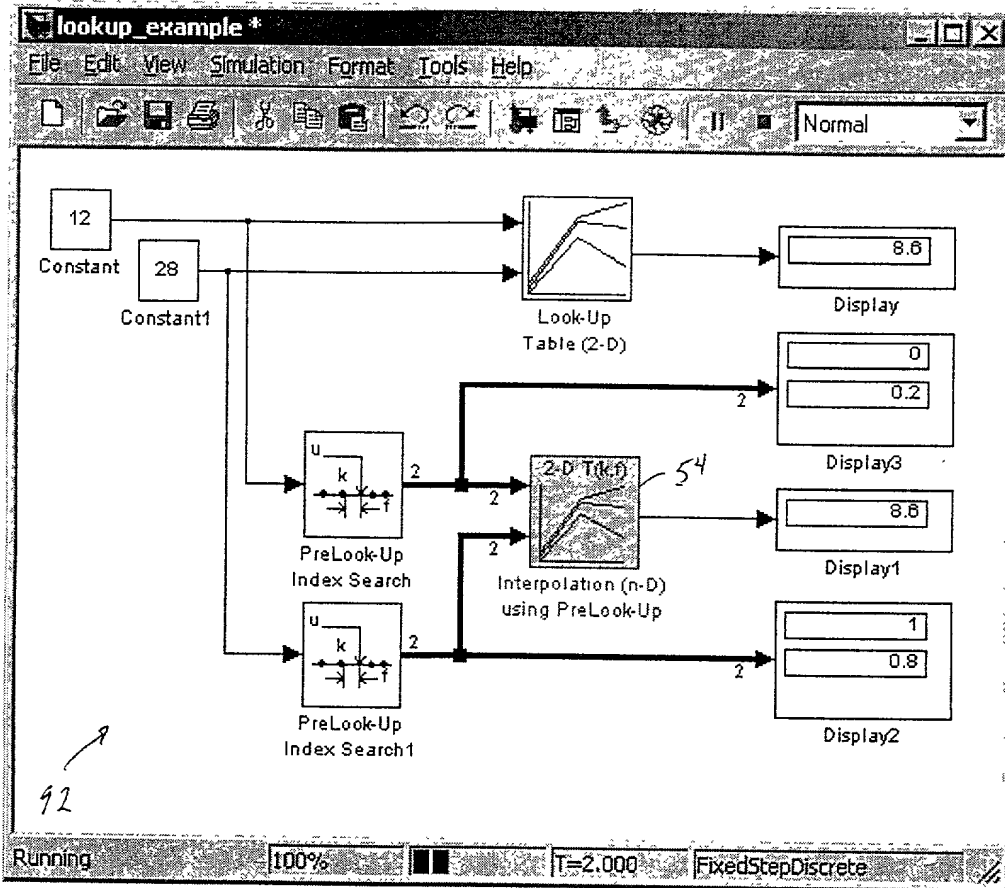


FIG. 9

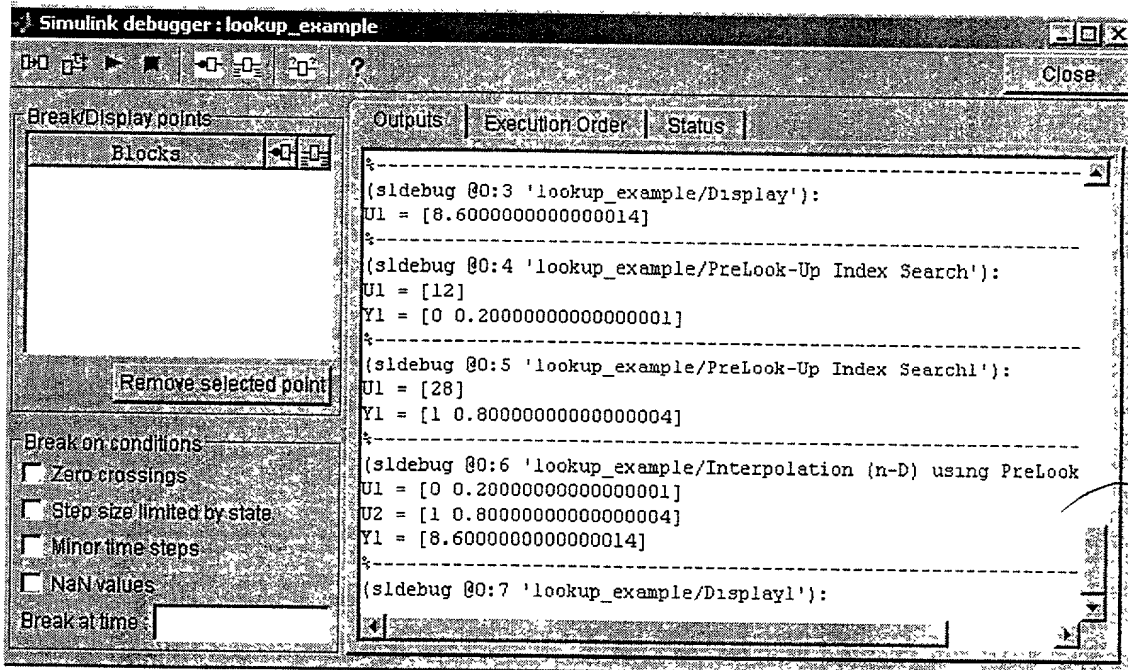


FIG. 10

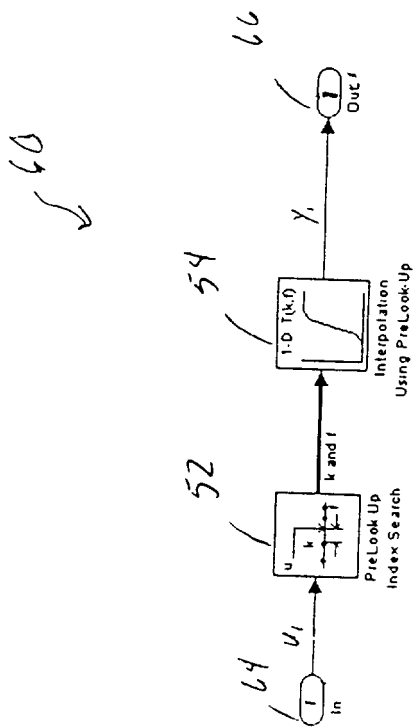


FIG. 3A